

### REMARKS

Claims 24, 25, 27-35, 45-50, 55, and 58 are currently pending in the Application and are rejected. The previously indicated allowability of Claims 27-29 and 45-50 has been withdrawn in view of newly discovered references.

Claims 27-29, 31-35, 55, and 58 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamada et al. (U.S. Pat. No. 5,501,739) in view of Tsu et al. (U.S. Pat. No. 6,096,597). *See, Action* at p. 2. Claim 24 stands rejected under 35 U.S.C. § 103(a) as being obvious in light of Yamada et al. and Tsu et al. in combination with Moleskin et al. (U.S. Pat. No. 5,217,559). *See, Id.* at p. 4, ¶ 16. Claim 25 stands rejected under 35 U.S.C. § 103(a) as being obvious in light of Yamada et al. and Tsu et al. in combination with Montev et al. (U.S. Pat. No. 4,578,880). *See, Id.* at p. 4, ¶ 21. Claims 30 and 45-50 stand rejected under 35 U.S.C. § 103(a) as being obvious in light of Yamada et al. and Tsu et al. in combination with Benzing (U.S. Pat. No. 4,786,352). *See, Id.* at p. 5. Applicants respectfully traverse these rejections.

### 35 U.S.C. § 103(a) Obviousness Rejections

All of the claims of the present application stand rejected under 35 U.S.C. § 103(a) as being obvious in light of the combination of Yamada et al. and Tsu et al., the combination being cited alone or with other references. However, the combination of Yamada et al. and Tsu et al. fails to teach or suggest all of the recitations of the claims. Furthermore, there is no motivation to combine Yamada et al. and Tsu et al. The lack of teaching and motivation for the alleged combination precludes a *prima facie* obviousness rejection because all of the necessary criteria for such a rejection are not met.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, **there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.** Second, there must be a reasonable expectation of success. **Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.** The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the

prior art, and not based on applicant's disclosure.

*See*, M.P.E.P. §2142, citing *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991)(emphasis added).

Applicants respectfully point out that Yamada et al. relates to an apparatus without a plasma chamber and Tsu et al. relates to a method of forming. Moreover, the Action appears to acknowledge the very different teachings of the Yamada et al. and Tsu et al.

Independent Claim 27 recites an apparatus for forming a thin film on a substrate comprising a multi-functional chamber and an oxygen radical or plasma annealing unit connected to the multi-functional chamber. The claimed oxygen radical or plasma annealing unit is configured to provide oxygen radical or plasma gas to the multi-functional chamber and includes a gas source selected from the group consisting of O<sub>2</sub>, NH<sub>3</sub>, Ar, N<sub>2</sub>, and N<sub>2</sub>O. Independent Claim 45 also includes similar recitations wherein an oxygen radical or plasma annealing unit is connected to the multi-functional chamber. The combination of Yamada et al. and Tsu et al. fails to teach such apparatuses.

Each of the present rejections rely on the combination of Yamada et al. with Tsu et al. to make obvious the claims. As pointed out by the Action, Yamada et al. fails "to teach the plasma chamber having an oxygen radical or plasma annealing unit connected to the chamber the annealing unit capable of supplying a gas selected from the group consisting of O<sub>2</sub>, NH<sub>3</sub>, Ar, N<sub>2</sub> and N<sub>2</sub>O." *See*, Action at ¶¶ 7 and 35. Tsu et al. also fails to teach or suggest a plasma chamber having an oxygen radical or plasma annealing unit connected to the multi-functional chamber. In fact, Tsu et al. discusses methods of forming, not an apparatus. Additionally, an oxygen radical or plasma annealing unit comprising a gas source selected from O<sub>2</sub>, NH<sub>3</sub>, Ar, N<sub>2</sub> and N<sub>2</sub>O is not disclosed by Tsu et al. At most, Tsu et al. proposes that a post dielectric deposition anneal will improve capacitor electrical performance and that the anneal may include an O<sub>2</sub> plasma anneal or an ozone anneal. Tsu et al. does not propose an apparatus, such as a multifunctional chamber, for carrying out such anneals. Thus, Tsu et al. also fails to describe an apparatus including an oxygen radical or plasma annealing unit connected to a multi-function chamber as

recited in independent Claims 27 and 45. The failure of both Yamada et al. and Tsu et al. to describe an oxygen radical or plasma annealing unit connected to a multi-functional chamber precludes the obviousness rejection of Claims 27 and 45 because the combination fails to teach or suggest all of the recitations of the claims. *See, In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

Furthermore, no clear and particular motivation exists to combine Yamada et al. and Tsu et al. to make obvious the apparatus claims of the present application as required under 35 U.S.C. § 103. The Action indicates that "it would have been obvious to one of ordinary skill in the art at the time the Applicants' invention was made to have provided an oxygen radical or plasma annealing unit in Yamada et al. in order to improve capacitor electrical performance including the effective oxide thickness and leakage current density as taught by Tsu et al." *See, Action* at ¶ 9. However, Tsu et al. says nothing about an oxygen radical or plasma annealing unit. In fact, as understood by Applicants, Tsu et al. does not disclose any apparatus. Tsu et al. proposes a post dielectric deposition anneal but does not propose an apparatus that may be used for such an anneal. Similarly, Yamada et al. fails to propose such an apparatus. Even if one of ordinary skill in the art were to process the substrates of Yamada et al. using an oxygen radical or plasma anneal process as discussed in Tsu et al. (which Applicants do not admit), the motivated oxygen radical or plasma anneal would not result in an apparatus as recited in independent Claims 27 and 45 because neither reference proposes an oxygen radical or plasma annealing unit connected to a multi-functional chamber. Neither reference motivates the formation of the claimed apparatus because the references, in combination, fail to teach or suggest all of the recitations of the claims.

Respectfully, it appears that the Action is using the teachings of the present application and the recitations of the claims to provide the motivation for the combination. Use of the present application to motivate the combination to support a *prima facie* obviousness rejection is impermissible hindsight.

Independent Claims 27 and 45 are not obvious in light of the combination of Yamada et

al. and Tsu et al. because the combination of references fails to teach or suggest all of the recitations of the claims. Furthermore, the Action has presented no clear and particular evidence of a motivation to support the rejection (except possibly the Applicants' own application). The lack of motivation and failure of the references to teach or suggest all of the recitations of the claims precludes a *prima facie* obviousness rejection. See, *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Applicants respectfully request the withdrawal of the 35 U.S.C. § 103(a) obviousness rejections of Claims 27 and 45 for at least the foregoing reasons.

Dependent Claims 24-25, 28-35, 46-50, 55, and 58 each depend from either Claim 27 or Claim 45. Claims 27 and 45 are independent claims that are not obvious. As dependent claims of nonobvious independent claims, each of Claims 24-25, 28-35, 46-50, 55, and 58 are also nonobvious. See, *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988)(stating that if an independent claim is nonobvious under 35 U.S.C. § 103 then any claim depending therefrom is nonobvious); see also, M.P.E.P. § 2143.03. Applicants respectfully request the allowance of Claims 24-25, 28-35, 46-50, 55, and 58 over the 35 U.S.C. § 103(a) obviousness rejections.

Dependent Claim 33 is also allowable over the 35 U.S.C. § 103(a) obviousness rejection because the combination of references does not teach or suggest a crystallization chamber connected to the transfer chamber as recited in the claim. The Action cites Tsu et al. for the proposition that a crystallization chamber could be added to the apparatus of Yamada et al. See, *Action* at ¶¶ 10-11. Tsu et al. does not propose a crystallization chamber, let alone a crystallization chamber that may be combined with the Yamada et al. apparatus. Tus et al. proposes a process but does not propose an apparatus of any type. Thus, the combination of references fails to teach or suggest all of the recitations of Claim 33, precluding a *prima facie* obviousness rejection. See, *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

Claim 34 is also allowable because neither of the combined references teach or suggest "an oxygen radical or plasma annealing chamber." The failure of the combined references to teach each and every recitation of Claim 34 precludes a *prima facie* obviousness rejection of Claim 34. See, *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).



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### CONCLUSION

The concerns of the Examiner addressed in full, Applicants respectfully request withdrawal of the outstanding rejections and the issuance of a Notice of Allowance forthwith. The Examiner is encouraged to direct any questions regarding the foregoing to the undersigned, who may be reached at (919) 854-1400.

Respectfully requested,

Devin R. Jensen  
Registration No. 44,805

**USPTO Customer No. 20792**  
Myers Bigel Sibley & Sajovec, P.A.  
Post Office Box 37428  
Raleigh, NC 27627  
Telephone (919) 854-1400  
Facsimile (919) 854-1401

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Cathy A. Schetzina